Naval Facilities Engineering Command Southwest
BRAC PMO West
San Diego, CA

FINAL
ANNUAL LANDFILL CAP OPERATION AND MAINTENANCE REPORT FOR 2019-2020

Post-Removal Action, Parcel E-2, Industrial Landfill

HUNTERS POINT NAVAL SHIPYARD, SAN FRANCISCO, CA

July 2020

Approved for public release; distribution is unlimited

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July 2020

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Southwest
BRAC PMO West
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Acronyms and Abbreviations

BRAC	Base Realignment and Closure
CSO	Caretaker Site Office
HPNS	Hunters Point Naval Shipyard
INYA	INYA Inc. (Prime Contractor)
IR-01/21	Installation Restoration Site 01/21
Navy	U.S. Department of the Navy
O&M	operation and maintenance
OMP	Operation and Maintenance Plan
Tetra Tech	Tetra Tech EM, Inc.

1.0 Introduction

INYA Inc. (INYA) is providing operation and maintenance (O&M) services under Contract No. N62473-19-C-0009 from the U.S. Department of the Navy (Navy), Base Realignment and Closure Program Management Office West. Under this contract INYA is tasked with providing technical support to maintain the landfill cap (installed as an interim remedy) at the former Industrial Landfill at Hunters Point Naval Shipyard (HPNS) in San Francisco, California (Figure 1). This former landfill is also identified as Installation Restoration (IR) Site 01/21 [IR-01/21] within Parcel E-2 at HPNS.

In August of 2000 a brush fire occurred on the surface of the landfill which resulted in subsurface smoldering that continued after the surface fire was extinguished. The solution implemented as an interim remedy, was a landfill cap constructed to cut off the oxygen supply to combustible materials in the body of the landfill. The interim remedy succeeded, and the subsurface fire was extinguished.

Construction began in 2019 to implement the "Final Remedy" at the former landfill. This included removal of vegetation and approximately 1 foot of topsoil from the top of the landfill (including the rock drain that traversed the landfill from the northeast to the southwest), and the initial perimeter grading. The perimeter grading at Parcel E-2 will provide a transition between landfill cap surface elevations and surrounding surfaces so that grades are no steeper than 3H:1V. Additional grading will be performed in areas designed to collect and direct surface runoff from the site.

The Operation and Maintenance Plan (OMP) prepared by Tetra Tech EM Inc. (Tetra Tech) describes procedures required to ensure the integrity of the interim landfill cap and the landfill gas control and monitoring system (Figure 2). The OMP also provides contingency plans in case of earthquakes, floods or major storm events, and fires (Tetra Tech 2003). This report documents the maintenance efforts provided during the period from July 2019 through June 2020, and contains the documents generated during those activities, as directed by the OMP.

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2.0 Operation and Maintenance Procedures

During the period from July 2019 through June 2020, INYA implemented the O&M program requiring site inspections and various actions to maintain the landfill cap and the landfill gas vent system.

2.1 Landfill Cap Irrigation

The landfill cap is required to be equipped with vegetative cover to provide sufficient erosion control. Therefore, vegetative cover is inspected quarterly to ensure there is no balding of the cover. However, since excavation of the existing vegetation was completed between May and June 2018, and subsequent grading of the landfill surface followed, the irrigation system was no longer in place during the July 2019 to June 2020 O&M period. The landfill is still being inspected and notes are provided on vegetation status of the landfill at the times of inspection. As a result, active irrigation will not be performed during the implementation of the final remedy.

2.2 Maintenance

Maintenance activities for the cap during the 2019-2020 reporting period were conducted using the inspection checklists provided in the OMP (Tetra Tech 2003). Copies of the completed forms are provided in Appendix A (General Site Inspection) and Appendix B (Vegetative Cover Inspection) of this report.

INYA personnel conducting O&M activities complied with the requirements specified in the OMP, including the site-specific Accident Prevention Plan.

2.2.1 General Site Inspection

During the period covered by this report, general site inspections of the landfill area were conducted quarterly (September 14, 2019, December 4, 2019, March 18, 2020 and June 16, 2020). At the time of each quarterly inspection, the landfill site was assessed to verify the condition of each item in the bullet list below (see Appendix A for field records). Those items marked with an asterisk (*) have additional information provided (for one or more of the inspections) about them in the discussion that follows the bullet list.

- Proper warning signs are present.
- Property fence is in good condition and secure from external access. *
- No large trees, brush, invasive plants, or weeds (with deep taproots) that may penetrate the cap are present on the cap.
- No soil erosion is evident on the cap or in adjacent areas (See Section 2.2.3).
- Erosion control measures, where applicable, are intact and functioning properly.
- No excessive vegetation is growing in the central gravel drainage ditch.
- No noticeable depressions or ponded water are present on the cap.
- No noticeable sliding, slope failure, or desiccation cracks are present in the soil cover.
- The landfill liner is not protruding, exposed, or torn.
- The landfill passive vents and turbines are in good working order. *
- There are no large areas (greater than 20 square feet) bare of vegetation. *
- All devices used to repel burrowing animals have charged batteries and are functioning properly. *

All regular inspections conducted for the year, were done while construction activities for the final remedy at Parcel E-2 are on-going. General inspections will continue until the final remedy is fully implemented and a new monitoring program is established.

Property Fence. The Parcel E-2 property fence restricts public access to the landfill site. During each of the general site inspections, the fences were checked for any damage that might allow public access to the site. There were no signs of damage to the fences.

Vents. The vents located along the barrier wall and extraction trench were examined on March 12, 2020, and individual carbon vessels at PV-04 and PV-05 were observed to have rust holes on the drum tops (see Figure 2 for locations). After consultation with the Navy, all vessels at both locations (a total of four carbon drums and two Hydrosil drums) were replaced in May 2020. A reading of 6.4% methane was made at monitoring point GMP01A along the barrier wall on March 12, 2020 causing the need to use the second "active" vent blower system, at location PV-05. The second system required repairs, as well as, ironically, the primary "active" vent blower system at location PV-02. Repairs to both systems were made in May 2020, and the second system was operational for ten days from May 26, 2020 through June 4, 2020. Monitoring results from May 28, 2020 and May 29, 2020 confirmed that the methane concentration in GMP01A had been reduced to 0.0%.

Bare Vegetation. Because part of the final remedy implementation was vegetation removal, most of the landfill surface now (temporarily) is devoid of vegetation.

Burrowing Animals. All of the Molecontrol® electronic animal-repelling devices were removed as part of the site activities associated with the installation of the final remedy. INYA will continue to monitor the landfill for mole activity and will maintain any devices installed in the future under this contract.

Settlement Surveys. As part of the routine inspection process, settlement marker locations and elevations are surveyed at specific intervals, as discussed below. The datum used to survey the settlement markers is control point BM1-E. The northing, easting, and elevation of the datum and settlement markers are summarized in Table 1. All data from the OMP and subsequent surveys are presented in the table. The OMP (Tetra Tech, 2003) stipulated that settlement marker locations and elevations are to be surveyed once every 6 months for the first year after construction, and once per year thereafter. When a settlement of 0.1 foot or less has been measured for two consecutive years, surveys can be scaled back to once every 5 years. Based on data collected from 2006 through 2008, both settlement markers had settled less than 0.1 foot per year for two consecutive years, as indicated in the tables below. Therefore, per the OMP, further settlement marker surveys have been scaled back to once every 5 years. The settlement markers were last surveyed on May 31, 2019 and compared to the 2013 survey data. Because the settlement is less than the 0.1-foot tolerance, the next required survey won't be until 2024. However, prior to 2024, new settlement monuments are expected to be installed as part of the final remedy.

2.2.2 Vegetative Cover Inspections

Semi-annual inspections of vegetative cover on the landfill cap and adjacent areas were performed on December 4, 2019 and June 16, 2020, to record and ensure that the vegetation growing over the landfill cap was sufficient to prevent soil erosion, without damaging the underlying geosynthetic membrane. The inspections were performed during ongoing construction activities associated with installation of the final remedy. The vegetative cover inspections include the items listed below (see Appendix B for completed field forms).

- Areas of stressed or missing vegetation;

- Areas of continual poor growth despite regrowth efforts;
- Invasive or deep-rooting species on the cap;
- Impacts from burrowing animals on the cap;
- Maturity of plants to allow for mowing.

TABLE 1. Landfill Settlement Surveys

	Measurement Point			
	BM-1E	SM-A	SM-B	MW-60-1
Type:	Datum	Settlement Marker	Settlement Marker	Monitoring Well
Northing:	451372.630	451749.583	451415.186	450982.551
Easting:	1458440.180	1457597.423	1457999.031	1457652.660
Elevation in 2003	--	31.00	27.70	--
Elevation on 5/17/2006	10.47	30.65	26.91	14.47
Elevation on 5/02/2007	10.47	30.63	26.90	--
Elevation on 6/11/2008	10.47	30.62	26.90	--
Elevation on 7/29/2013	--	30.63	26.90	--
Elevation on 5/31/2019	--	30.60	26.90	--

The inspections are primarily being performed to observe the presence of the following invasive species on the landfill cap that could penetrate and damage the liner:

- Cocklebur (Xanthium strumarium)
- Black mustard (Brassica nigra)
- Short-pod mustard (Hirschfeldia incana)
- Wild radish (Raphanus raphanistrum)
- Cultivated radish (Raphanus sativus)
- Sour clover (Melilotus indica)
- Sweet clover (Melilotus officinalis)
- Cheeseweed (Malva parviflora)
- Pampas grass (Cortaderia sp.)
- Sweetfennel (Foeniculum vulgare).

As described previously, the inspections conducted from July 2019 through June 2020, were all after the vegetation was removed from the landfill cap as part of the final remedy. However, most of these species were still present in the areas around the landfill that were not excavated. Vegetation is reestablishing itself on the landfill but invasive species were not identified. Photos of the landfill cap are included in Appendix C.

2.2.3 Soil Erosion Control

The storm water collection system (provided by a riprap central drainage swale across the landfill cap) was removed as part of initial construction activities associated with the final remedy. Any invasive plants observed on the landfill will need to be removed with hand tools.

2.3 Health and Safety

The Parcel E-2 property fence restricts public access to the landfill site. Even though the landfill has been radiologically down-graded, the radiological contractor still maintains signs and rope to prevent unauthorized personnel from entering the site.

Because the OMP identifies the security fencing around the landfill a safety issue, they were checked during general site inspections, and informally throughout the year for any damage that might allow public access to the site. Whenever breaches are encountered, the HPNS Caretaker Site Officer (CSO) is notified of the situation so that fence repairs can be made.

Warning signs, such as posted speed limits and "Restricted Area" signs, are posted along the fence to control traffic and public access to the site. The signs are prominently displayed around the perimeter of the landfill. During general site inspections, the signs at the entrance gates and at the northern edge of the cap were checked to ensure that they were visible and in good condition.

3.0 Contingency Plans

The OMP provides emergency response inspection procedures to be implemented in the event of any natural disaster which might occur in the San Francisco Bay area and could affect the Industrial Landfill. Potential natural disasters include earthquakes, floods or major storms, or fire, as described below.

3.1 Earthquakes

The OMP states that in the event of a significant earthquake (7.0 magnitude or higher centered within 40 miles of the site, 6.0 magnitude or higher within 10 miles, or 4.0 magnitude or higher within 1 mile), the landfill cap will be visually inspected for damage. ***During the 2019-2020 monitoring period, no earthquake meeting these conditions occurred.***

3.2 Floods or Major Storms

The OMP states that in the event of a major storm (defined as 4.17 inches of precipitation or more over a 24-hour period), the landfill cap will be visually inspected for damage. ***During the 2019-2020 monitoring period, no qualifying storm occurred***.

3.3 Fire

In the event of a surface fire near the landfill cap, the Navy's integrated contingency plan would be implemented, and the fire would be followed by a thorough inspection of the landfill cap to ensure that the integrity of the synthetic layers had not been compromised. ***During the 2019-2020 monitoring period, no qualifying fire occurred.***

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4.0 References

Tetra Tech EM Inc. (Tetra Tech), 2003. Operation and Maintenance Plan, IR-01/21, Industrial Landfill, Parcel E, Hunters Point Shipyard, San Francisco, CA, Final. June 12.

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FIGURES

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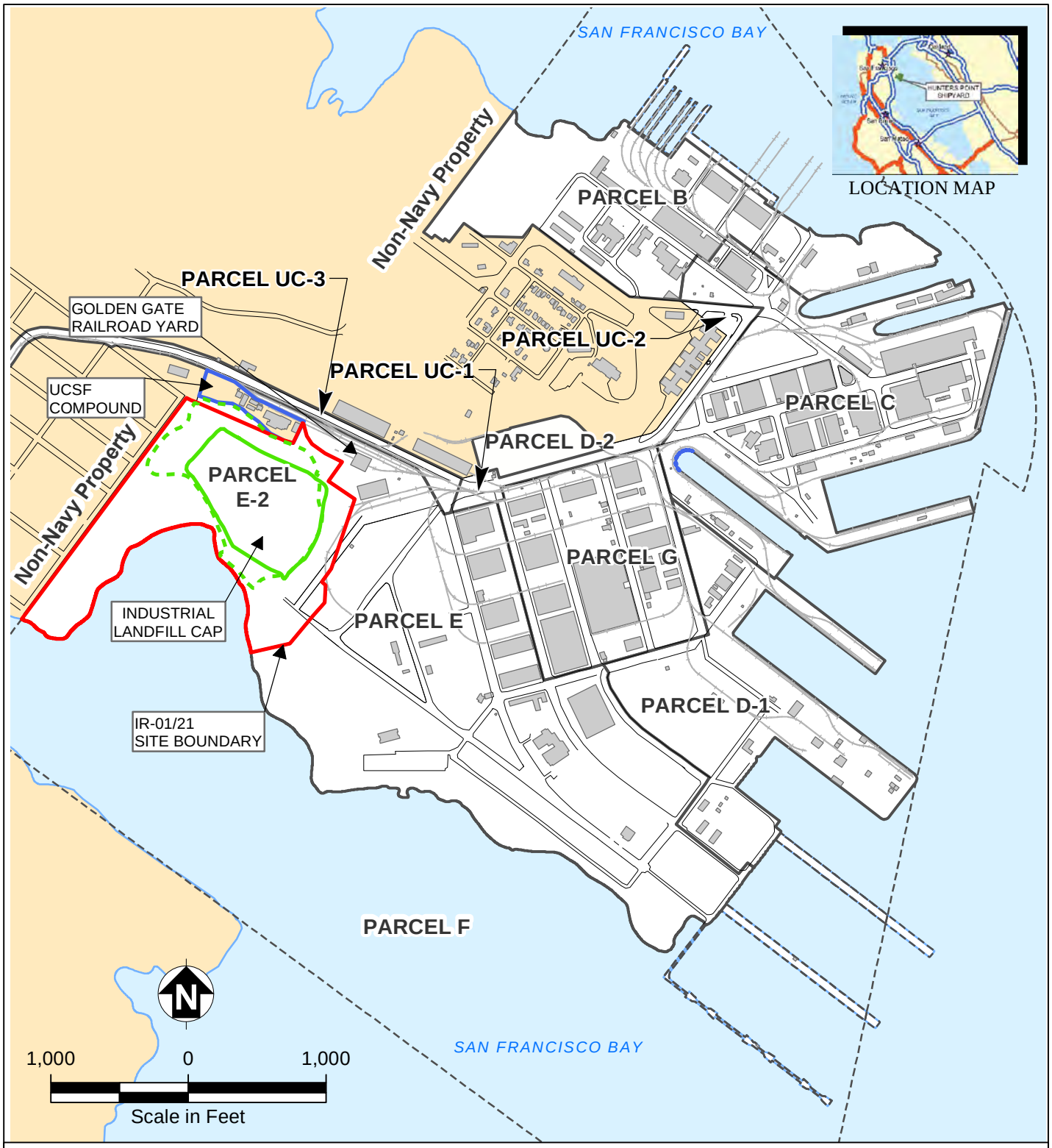


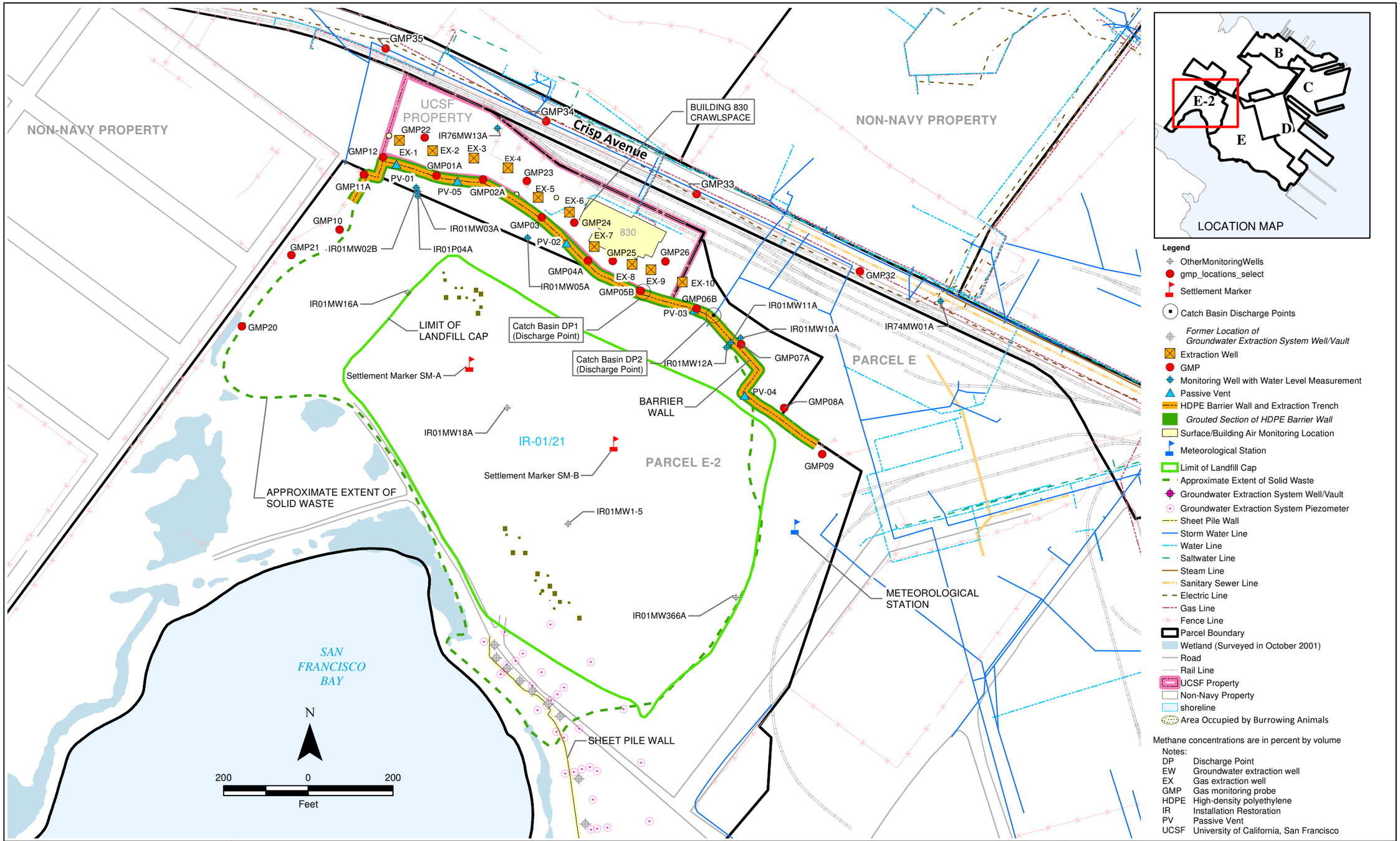
- Parcel Boundary
- University of California, San Francisco Compound
- Parcel F Boundary
- Non-Navy Property
- Building
- Rail Line
- Road
- Parcel E-2 Boundary
- Parcel F Boundary
- Estimate of Solid Waste Extent
- Interim Landfill Cap Extent

INYA INC.

Hunters Point Naval Shipyard, San Francisco, California
Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 1

SITE VICINITY MAP



INYA INC.

Parcel E-2 Annual Report
Hunters Point Naval Shipyard
San Francisco, California

FIGURE 2
Site Map and
Landfill Gas Monitoring Locations

APPENDIX A

GENERAL SITE INSPECTION CHECKLISTS

September 14, 2019

December 4, 2019

March 12, 2020

June 16, 2020

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GENERAL SITE INSPECTION CHECKLIST

File completed forms with the Navy Base Realignment and Closure Office in San Diego, California, and the Hunters Point Shipyard Caretaker Site Office (CSO). To contact the CSO, call (415) 743-4720.

1. Does the soil on the cap appear to be disturbed to the point that the geosynthetic layers underneath could be damaged (deeper than 18 inches below cap surface) or are there areas of exposed geosynthetic liner material?

☐ Yes *
☒ No

** If yes, uncover the area and visually inspect the drainage net and underlying geosynthetics. If damaged, repair in accordance with manufacturer's instructions.*

2. Are there open holes in the soil on the cap that may be caused by burrowing animals?

☐ Yes *
☒ No

** If yes, fill up the hole with clean soil (contains no analytes of concern) and report to the CSO. Suggested corrective action: install a Molecontrol® device or similar system.*

3. Are there noticeable depressions or ponding of surface water on the landfill cover?

☐ Yes *
☒ No

** If yes, backfill the depression with the soil type described in Appendix E, Landfill Cap Construction, of the operation and maintenance (O&M) plan to restore grade of the cap as shown on Figure 5 of Appendix E. Where soil erosion seems excessive and continual, corrective action may be needed (contact the CSO).*

4. Are there large (more than 2 inches wide or extend to cap liner) cracks in the soil cover?

☐ Yes *
☒ No

** If yes, notify the CSO to assess whether the cracks are due to desiccation or slope failure. Note the orientation, location, and frequency of cracks, and photograph areas of concern, if possible.*

5. Have any trees or shrubs grown on the landfill cover?

☐ Yes *
☒ No

** If yes, remove the tree(s) or shrub(s).*

6. If applicable, inspect all Molecontrol® devices (or similar system to ward off burrowing animals). Is each device functioning properly?

☐ Yes
☐ No *

** If no, first replace the batteries of the inoperative device. If the Molecontrol® device is still not functioning, replace the device by contacting D&D Chemical, Inc. ([800] 434-0221) or visiting http://www.ddchem.com/molecontrol.htm. Mark new devices, so they can be easily located during future inspections.* N/A

7. Is each sprinkler head upright?

☐ Yes
☐ No * N/A

** If no, adjust pipes so that sprinkler heads stand vertically.*

8. Operate the sprinkler system by opening the water source (Figure 2 of the O&M plan for the approximate location of the water service). Is each sprinkler head functioning properly (adequate pressure so that arcs of spray overlap)?

☐ Yes
☐ No * N/A

** If no, repair defects (that is, adjust pressure at the hydrant, remove clogs, and replace broken sprinkler heads).*

9. Are landfill passive vents and turbines in good working order (for example, vents are not damaged, valves are open, turbines are free to spin from wind force)?

☒ Yes
☐ No *

** If no, notify the CSO to repair vents or turbines.*

10. Are silt fences, hay bales, fiber rolls, gravel or sand bags, and other erosion control measures (Figure 2) intact and functioning properly?

☒ Yes
☐ No *

** If no, notify the CSO to repair the silt fence and hay bales.*

11. Is there excessive accumulation of sediment (buildup of more than one-third of the height of the fence)?

☐ Yes *
☒ No

** If yes, clear the excessive buildup of sediment and notify the CSO to have the sediment characterized and properly disposed of off site.*

12. Is there excessive vegetation (large stalks that would impede surface water flow) in the central gravel drainage ditch?

☐ Yes *
☒ No

** If yes, remove the vegetation by spraying it with herbicides that contain no analytes of concern.*

13. Inspect areas that channel water runoff at the site (landfill cap and adjacent areas), including the gully (Figure 2), ditches, slope edges, and pipe outlets. Are there signs of erosion from storm water runoff?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

14. Inspect condition of gravel roads (Figure 2). Are any ruts or potholes large enough to hinder vehicular traffic?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

15. Are posted signs in place and in good condition (legible)? See Figure 2 of the O&M plan for locations of signs and Photographs A-1 and A-2 of this appendix for examples of posted signs.

☒ Yes
☐ No *

** If no, mark location(s) of damaged or missing signs on Figure 2 and notify the CSO for repairs or replacements.*

16. Is the landfill adequately secured by a perimeter fence that is in good condition and shows no signs of having been trespassed?

☒ Yes
☐ No *

** If no, secure the perimeter fence with locks obtained from the CSO. If the fence is damaged, mark location of damage and notify the CSO for repairs.*

Additional Notes ***(Time, temperature, and wind direction, and other observations)***

Approximately 65°
Wind 8-12 mph to southeast

Soil cap under construction as part of the installation of the final remedy. This phase is winding down and more grading including fill material is anticipated.

Very little sparce vegetation on the cap but mostly bare dirt. No mole activity due to construction activity.

Passive Vents inspected and appear to be functioning properly

Roads/signs are in good condition.

Howard Wittenberg
Name of Inspector

Inyo
Company

Signature of Inspector

September 14, 2019 10am
Time and Date of Inspection

GENERAL SITE INSPECTION CHECKLIST

File completed forms with the Navy Base Realignment and Closure Office in San Diego, California, and the Hunters Point Shipyard Caretaker Site Office (CSO). To contact the CSO, call (415) 743-4720.

1. Does the soil on the cap appear to be disturbed to the point that the geosynthetic layers underneath could be damaged (deeper than 18 inches below cap surface) or are there areas of exposed geosynthetic liner material?

☐ Yes *
☒ No

** If yes, uncover the area and visually inspect the drainage net and underlying geosynthetics. If damaged, repair in accordance with manufacturer's instructions.*

2. Are there open holes in the soil on the cap that may be caused by burrowing animals?

☐ Yes *
☒ No

** If yes, fill up the hole with clean soil (contains no analytes of concern) and report to the CSO. Suggested corrective action: install a Molecontrol® device or similar system.*

3. Are there noticeable depressions or ponding of surface water on the landfill cover?

☐ Yes *
☒ No

** If yes, backfill the depression with the soil type described in Appendix E, Landfill Cap Construction, of the operation and maintenance (O&M) plan to restore grade of the cap as shown on Figure 5 of Appendix E. Where soil erosion seems excessive and continual, corrective action may be needed (contact the CSO).*

4. Are there large (more than 2 inches wide or extend to cap liner) cracks in the soil cover?

☐ Yes *
☒ No

** If yes, notify the CSO to assess whether the cracks are due to desiccation or slope failure. Note the orientation, location, and frequency of cracks, and photograph areas of concern, if possible.*

5. Have any trees or shrubs grown on the landfill cover?

☐ Yes *
☒ No

** If yes, remove the tree(s) or shrub(s).*

6. If applicable, inspect all Molecontrol® devices (or similar system to ward off burrowing animals). Is each device functioning properly?

☐ Yes
☐ No * N/A

** If no, first replace the batteries of the inoperative device. If the Molecontrol® device is still not functioning, replace the device by contacting D&D Chemical, Inc. ([800] 434-0221) or visiting http://www.ddchem.com/molecontrol.htm. Mark new devices, so they can be easily located during future inspections.*

7. Is each sprinkler head upright?

☐ Yes
☐ No * N/A

** If no, adjust pipes so that sprinkler heads stand vertically.*

8. Operate the sprinkler system by opening the water source (Figure 2 of the O&M plan for the approximate location of the water service). Is each sprinkler head functioning properly (adequate pressure so that arcs of spray overlap)?

☐ Yes N/A
☐ No *

** If no, repair defects (that is, adjust pressure at the hydrant, remove clogs, and replace broken sprinkler heads).*

9. Are landfill passive vents and turbines in good working order (for example, vents are not damaged, valves are open, turbines are free to spin from wind force)?

☒ Yes
☐ No *

** If no, notify the CSO to repair vents or turbines.*

10. Are silt fences, hay bales, fiber rolls, gravel or sand bags, and other erosion control measures (Figure 2) intact and functioning properly?

☒ Yes
☐ No *

** If no, notify the CSO to repair the silt fence and hay bales.*

11. Is there excessive accumulation of sediment (buildup of more than one-third of the height of the fence)?

☐ Yes *
☒ No

** If yes, clear the excessive buildup of sediment and notify the CSO to have the sediment characterized and properly disposed of off site.*

12. Is there excessive vegetation (large stalks that would impede surface water flow) in the central gravel drainage ditch?

☐ Yes *
☒ No

** If yes, remove the vegetation by spraying it with herbicides that contain no analytes of concern.*

13. Inspect areas that channel water runoff at the site (landfill cap and adjacent areas), including the gully (Figure 2), ditches, slope edges, and pipe outlets. Are there signs of erosion from storm water runoff?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

14. Inspect condition of gravel roads (Figure 2). Are any ruts or potholes large enough to hinder vehicular traffic?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

15. Are posted signs in place and in good condition (legible)? See Figure 2 of the O&M plan for locations of signs and Photographs A-1 and A-2 of this appendix for examples of posted signs.

☒ Yes
☐ No *

** If no, mark location(s) of damaged or missing signs on Figure 2 and notify the CSO for repairs or replacements.*

16. Is the landfill adequately secured by a perimeter fence that is in good condition and shows no signs of having been trespassed?

[X] Yes
[ ] No *

** If no, secure the perimeter fence with locks obtained from the CSO. If the fence is damaged, mark location of damage and notify the CSO for repairs.*

Additional Notes ***(Time, temperature, and wind direction, and other observations)***

Approx. 60° - wet weather

Winds approx. 5 mph - S/SE

The landfill cap is currently under construction while the final remedy is being implemented.

Approx. 2'-3' of soil has been removed from the cap and the rock ditch has been removed.

The Mole Control devices have been removed. Not a lot of mole activity was observed.

Sparce non-intrusive vegetation is present on the land fill cap.

Roads and signage in good condition.

Howard Wittenberg
Name of Inspector

Inya
Company

Signature of Inspector

12/4/19 10am
Time and Date of Inspection

GENERAL SITE INSPECTION CHECKLIST

File completed forms with the Navy Base Realignment and Closure Office in San Diego, California, and the Hunters Point Shipyard Caretaker Site Office (CSO). To contact the CSO, call (415) 743-4720.

1. Does the soil on the cap appear to be disturbed to the point that the geosynthetic layers underneath could be damaged (deeper than 18 inches below cap surface) or are there areas of exposed geosynthetic liner material?

☐ Yes *
☒ No

** If yes, uncover the area and visually inspect the drainage net and underlying geosynthetics. If damaged, repair in accordance with manufacturer's instructions.*

2. Are there open holes in the soil on the cap that may be caused by burrowing animals?

☐ Yes *
☒ No

** If yes, fill up the hole with clean soil (contains no analytes of concern) and report to the CSO. Suggested corrective action: install a Molecontrol® device or similar system.*

3. Are there noticeable depressions or ponding of surface water on the landfill cover?

☐ Yes *
☒ No

** If yes, backfill the depression with the soil type described in Appendix E, Landfill Cap Construction, of the operation and maintenance (O&M) plan to restore grade of the cap as shown on Figure 5 of Appendix E. Where soil erosion seems excessive and continual, corrective action may be needed (contact the CSO).*

4. Are there large (more than 2 inches wide or extend to cap liner) cracks in the soil cover?

☐ Yes *
☒ No

** If yes, notify the CSO to assess whether the cracks are due to desiccation or slope failure. Note the orientation, location, and frequency of cracks, and photograph areas of concern, if possible.*

5. Have any trees or shrubs grown on the landfill cover?

☐ Yes *
☒ No

** If yes, remove the tree(s) or shrub(s).*

6. If applicable, inspect all Molecontrol® devices (or similar system to ward off burrowing animals). Is each device functioning properly?

☐ Yes
☐ No *

N/A

** If no, first replace the batteries of the inoperative device. If the Molecontrol® device is still not functioning, replace the device by contacting D&D Chemical, Inc. ([800] 434-0221) or visiting http://www.ddchem.com/molecontrol.htm. Mark new devices, so they can be easily located during future inspections.*

7. Is each sprinkler head upright?

☐ Yes
☐ No *

N/A

** If no, adjust pipes so that sprinkler heads stand vertically.*

8. Operate the sprinkler system by opening the water source (Figure 2 of the O&M plan for the approximate location of the water service). Is each sprinkler head functioning properly (adequate pressure so that arcs of spray overlap)?

☐ Yes
☐ No *

N/A

** If no, repair defects (that is, adjust pressure at the hydrant, remove clogs, and replace broken sprinkler heads).*

9. Are landfill passive vents and turbines in good working order (for example, vents are not damaged, valves are open, turbines are free to spin from wind force)?

PV-04 and PV-05 have rust holes in carbon drum.

☒ Yes
☒ No *

** If no, notify the CSO to repair vents or turbines.*

10. Are silt fences, hay bales, fiber rolls, gravel or sand bags, and other erosion control measures (Figure 2) intact and functioning properly?

☒ Yes
☐ No *

** If no, notify the CSO to repair the silt fence and hay bales.*

11. Is there excessive accumulation of sediment (buildup of more than one-third of the height of the fence)?

☐ Yes *
☒ No

** If yes, clear the excessive buildup of sediment and notify the CSO to have the sediment characterized and properly disposed of off site.*

12. Is there excessive vegetation (large stalks that would impede surface water flow) in the central gravel drainage ditch?

☐ Yes *
☒ No

** If yes, remove the vegetation by spraying it with herbicides that contain no analytes of concern.*

13. Inspect areas that channel water runoff at the site (landfill cap and adjacent areas), including the gully (Figure 2), ditches, slope edges, and pipe outlets. Are there signs of erosion from storm water runoff?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

14. Inspect condition of gravel roads (Figure 2). Are any ruts or potholes large enough to hinder vehicular traffic?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

15. Are posted signs in place and in good condition (legible)? See Figure 2 of the O&M plan for locations of signs and Photographs A-1 and A-2 of this appendix for examples of posted signs.

☒ Yes
☐ No *

** If no, mark location(s) of damaged or missing signs on Figure 2 and notify the CSO for repairs or replacements.*

16. Is the landfill adequately secured by a perimeter fence that is in good condition and shows no signs of having been trespassed?

☒ Yes
☐ No *

** If no, secure the perimeter fence with locks obtained from the CSO. If the fence is damaged, mark location of damage and notify the CSO for repairs.*

Additional Notes ***(Time, temperature, and wind direction, and other observations)***

Air temp mid 60°F to low 70°F.; light winds.
Partly cloudy but dry; had rained preceding 2 days.

Vegetation on landfill cover is sparse but present; growing season not yet started.

Derrick Coleman
Name of Inspector

INYA, Inc.
Company

Signature of Inspector

11:30 AM - 1:50 PM March 12, 2020
Time and Date of Inspection

GENERAL SITE INSPECTION CHECKLIST

File completed forms with the Navy Base Realignment and Closure Office in San Diego, California, and the Hunters Point Shipyard Caretaker Site Office (CSO). To contact the CSO, call (415) 743-4720.

1. Does the soil on the cap appear to be disturbed to the point that the geosynthetic layers underneath could be damaged (deeper than 18 inches below cap surface) or are there areas of exposed geosynthetic liner material?

☐ Yes *
☒ No

** If yes, uncover the area and visually inspect the drainage net and underlying geosynthetics. If damaged, repair in accordance with manufacturer's instructions.*

2. Are there open holes in the soil on the cap that may be caused by burrowing animals?

☐ Yes *
☒ No

** If yes, fill up the hole with clean soil (contains no analytes of concern) and report to the CSO. Suggested corrective action: install a Molecontrol® device or similar system.*

3. Are there noticeable depressions or ponding of surface water on the landfill cover?

☐ Yes *
☒ No

** If yes, backfill the depression with the soil type described in Appendix E, Landfill Cap Construction, of the operation and maintenance (O&M) plan to restore grade of the cap as shown on Figure 5 of Appendix E. Where soil erosion seems excessive and continual, corrective action may be needed (contact the CSO).*

4. Are there large (more than 2 inches wide or extend to cap liner) cracks in the soil cover?

☐ Yes *
☒ No

** If yes, notify the CSO to assess whether the cracks are due to desiccation or slope failure. Note the orientation, location, and frequency of cracks, and photograph areas of concern, if possible.*

5. Have any trees or shrubs grown on the landfill cover?

☐ Yes *
☒ No

** If yes, remove the tree(s) or shrub(s).*

6. If applicable, inspect all Molecontrol® devices (or similar system to ward off burrowing animals). Is each device functioning properly?

☐ Yes
☐ No * N/A

** If no, first replace the batteries of the inoperative device. If the Molecontrol® device is still not functioning, replace the device by contacting D&D Chemical, Inc. ([800] 434-0221) or visiting http://www.ddchem.com/molecontrol.htm. Mark new devices, so they can be easily located during future inspections.*

7. Is each sprinkler head upright?

☐ Yes N/A
☐ No *

** If no, adjust pipes so that sprinkler heads stand vertically.*

8. Operate the sprinkler system by opening the water source (Figure 2 of the O&M plan for the approximate location of the water service). Is each sprinkler head functioning properly (adequate pressure so that arcs of spray overlap)?

☐ Yes
☐ No *

N/A

** If no, repair defects (that is, adjust pressure at the hydrant, remove clogs, and replace broken sprinkler heads).*

9. Are landfill passive vents and turbines in good working order (for example, vents are not damaged, valves are open, turbines are free to spin from wind force)?

☒ Yes
☐ No *

** If no, notify the CSO to repair vents or turbines.*

10. Are silt fences, hay bales, fiber rolls, gravel or sand bags, and other erosion control measures (Figure 2) intact and functioning properly?

☒ Yes
☐ No *

** If no, notify the CSO to repair the silt fence and hay bales.*

11. Is there excessive accumulation of sediment (buildup of more than one-third of the height of the fence)?

☐ Yes *
☒ No

** If yes, clear the excessive buildup of sediment and notify the CSO to have the sediment characterized and properly disposed of off site.*

12. Is there excessive vegetation (large stalks that would impede surface water flow) in the central gravel drainage ditch?

☐ Yes *
☒ No

** If yes, remove the vegetation by spraying it with herbicides that contain no analytes of concern.*

13. Inspect areas that channel water runoff at the site (landfill cap and adjacent areas), including the gully (Figure 2), ditches, slope edges, and pipe outlets. Are there signs of erosion from storm water runoff?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

14. Inspect condition of gravel roads (Figure 2). Are any ruts or potholes large enough to hinder vehicular traffic?

☐ Yes *
☒ No

** If yes, notify the CSO to assess the appropriate course of action for repair.*

15. Are posted signs in place and in good condition (legible)? See Figure 2 of the O&M plan for locations of signs and Photographs A-1 and A-2 of this appendix for examples of posted signs.

☒ Yes
☐ No *

** If no, mark location(s) of damaged or missing signs on Figure 2 and notify the CSO for repairs or replacements.*

16. Is the landfill adequately secured by a perimeter fence that is in good condition and shows no signs of having been trespassed?

☒ Yes
☐ No *

** If no, secure the perimeter fence with locks obtained from the CSO. If the fence is damaged, mark location of damage and notify the CSO for repairs.*

Additional Notes ***(Time, temperature, and wind direction, and other observations)***

The grass on the landfill cap is in a dormant (dry) condition normal for this season.

Road to treatment systems is slightly rutted but passable.

80°F, dry, sl wind F SW

Chris McCormack
Name of Inspector

ECM
Company

Signature of Inspector

11:30 6/16/2020
Time and Date of Inspection

APPENDIX B

VEGETATIVE COVER INSPECTION CHECKLISTS

December 4, 2019

June 16, 2020

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VEGETATIVE COVER INSPECTION CHECKLIST

File completed forms with the Navy Base Realignment and Closure Office in San Diego, California, and the Hunters Point Shipyard Caretaker Site Office (CSO). To contact the CSO, call (415) 743-4720.

1. Are there areas larger than 20 square feet of stressed or missing vegetation at the site (both landfill cover and adjacent areas)?

☒ Yes *
☐ No see notes

** If yes, re-establish vegetative growth by watering or reseeding in accordance with Appendix E, Landfill Cap Construction, of this operation and maintenance (O&M) plan.*

2. Are there known areas of continual poor growth despite reseeding efforts?

☐ Yes *
☒ No

** If there are areas of continual poor growth on the cap and if sprinkler system is still in operation, inspect the sprinkler system while it is active to assess whether poor growth is caused by a lack of water. If this is the case, notify the CSO, so repairs can be made to the sprinkler system. If poor growth does not seem to be caused by a lack of water, consider testing the soil for pH, heavy metals, or other potential causes. If areas adjacent to the cap have areas of continual poor growth, notify the CSO so that reseeding efforts can be made to better establish growth.*

3. Have invasive or deep-rooting species that may penetrate the cap membrane taken root on the cap soil cover?

☐ Yes *
☒ No

Previously found species with taproots potentially able to penetrate membrane are (see plant identification guide included in this appendix):

On Cap Cover	Around Perimeter of Cap
Cocklebur *(Xanthium strumarium)*	Cheeseweed *(Malva parviflora)*
Black mustard *(Brassica nigra)*	Pampas grass *(Cortaderia sp.)*
Short-pod mustard (*Hirschfeldia incana)*	Sweet fennel *(Foeniculum vulgare)*
Wild radish *(Raphanus raphanistrum)*	
Cultivated radish *(Raphanus sativus)*	
Sour clover *(Melilotus indica)*	
Sweet clover *(Melilotus officinalis)*	

** If yes, identify the affected area and observed plant species, develop a strategy to remove the invasive plants (permanently if possible), and make recommendations to the CSO. One recommended approach is to spot spray the species with an herbicide that contains no analytes of concern; this approach may take up to 4 days, depending on the extent of removal. Roots can also be cut out. Inspect the area every 2 weeks following removal to ensure that invasive species have not returned.*

Additionally, for inspections performed during the summer:

4. Have the desired seeds (see Appendix E, Landfill Cap Construction) matured sufficiently to allow for mowing?

☐ Yes *
☒ No

** If yes, determine an appropriate time and frequency for mowing and recommend this schedule to the CSO. Be sure to have cuttings gathered and taken off of the vegetative cover following mowing.*

Additional Notes ***(Time, temperature, and wind direction, and other observations)***

Temp ~ 60° Wind - 5 mph - S/SE

overcast - has been raining

The landfill is currently under construction as the Final Remedy is being installed. Approx. 2' of cover has been removed from the landfill cap. The rock drainage channel has been removed.

Plants remain in the areas around the landfill but the cap has a dormant juvenile cover of vegetation.

David Wittenberg
Name of Inspector

INYA
Company

Signature of Inspector

12/4/19 11am
Time and Date of Inspection

VEGETATIVE COVER INSPECTION CHECKLIST

File completed forms with the Navy Base Realignment and Closure Office in San Diego, California, and the Hunters Point Shipyard Caretaker Site Office (CSO). To contact the CSO, call (415) 743-4720.

1. Are there areas larger than 20 square feet of stressed or missing vegetation at the site (both landfill cover and adjacent areas)?

☐ Yes *
☒ No

** If yes, re-establish vegetative growth by watering or reseeding in accordance with Appendix E, Landfill Cap Construction, of this operation and maintenance (O&M) plan.*

2. Are there known areas of continual poor growth despite reseeding efforts?

☐ Yes *
☒ No

** If there are areas of continual poor growth on the cap and if sprinkler system is still in operation, inspect the sprinkler system while it is active to assess whether poor growth is caused by a lack of water. If this is the case, notify the CSO, so repairs can be made to the sprinkler system. If poor growth does not seem to be caused by a lack of water, consider testing the soil for pH, heavy metals, or other potential causes. If areas adjacent to the cap have areas of continual poor growth, notify the CSO so that reseeding efforts can be made to better establish growth.*

3. Have invasive or deep-rooting species that may penetrate the cap membrane taken root on the cap soil cover?

☐ Yes *
☒ No

Previously found species with taproots potentially able to penetrate membrane are (see plant identification guide included in this appendix):

On Cap Cover	Around Perimeter of Cap
Cocklebur *(Xanthium strumarium)*	Cheeseweed *(Malva parviflora)*
Black mustard *(Brassica nigra)*	Pampas grass *(Cortaderia sp.)*
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Wild radish *(Raphanus raphanistrum)*	
Cultivated radish *(Raphanus sativus)*	
Sour clover *(Melilotus indica)*	
Sweet clover *(Melilotus officinalis)*	

** If yes, identify the affected area and observed plant species, develop a strategy to remove the invasive plants (permanently if possible), and make recommendations to the CSO. One recommended approach is to spot spray the species with an herbicide that contains no analytes of concern; this approach may take up to 4 days, depending on the extent of removal. Roots can also be cut out. Inspect the area every 2 weeks following removal to ensure that invasive species have not returned.*

Additionally, for inspections performed during the summer:

4. Have the desired seeds (see Appendix E, Landfill Cap Construction) matured sufficiently to allow for mowing?

☐ Yes *
☒ No N/A /ND

** If yes, determine an appropriate time and frequency for mowing and recommend this schedule to the CSO. Be sure to have cuttings gathered and taken off of the vegetative cover following mowing.*

Additional Notes ***(Time, temperature, and wind direction, and other observations)***

80°F, dry, slight wind from SW

The grass on the landfill cap is in a dry/dormant condition, normal for this time of year/season

Chris McCormack
Name of Inspector

ECM
Company

Signature of Inspector

11:30 6/16/2020
Time and Date of Inspection

APPENDIX C

PHOTOGRAPHS

Photo #1 (September 2019) – View of landfill looking south

Photo #2 (September 2019) – Photo of western part of landfill looking south/southwest

Photo #3 (September 2019) – View of perimeter road on north side of landfill

Photo #4 (December 2019) – Photo of landfill looking south

Photo #5 (June 2019) – View of landfill looking south from north perimeter road

Photo #6 (March 2020) – View of landfill cap looking south

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Photo #1 (September 2019) – View of landfill looking south.

Photo #2 (September 2019) – Photo of western part of landfill looking south/southwest.

Photo #3 (September 2019) – View of perimeter road on north side of landfill.

Photo #4 (December 2019) – Photo of landfill looking south.

Photo #5 (June 2019) – View of landfill looking south from north perimeter road.

Photo #6 (March 2020) – View of landfill cap looking south

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